Environmental Engineering, Civil Engineering
Forensic Engineering, Construction Services

ADMINISTRATIVE CONSENT ORDER
PROGRESS REPORT
MARCH 2018

Former United Shoe Machinery Division North Parcel
181 Elliott Street
Beverly, MA 01915

Prepared for:

Cummings Properties, LLC
200 West Cummings Park
Woburn, MA 01801

Prepared by:

FSL Associates, Inc.
358 Chestnut Hill Avenue
Boston, MA 02135

April 13, 2018

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APPENDICES

1.0 INTRODUCTION

This Progress Report was prepared in order to detail the field and sampling activities associated with the former United Shoe Machinery (USM) Division North Parcel at 181 Elliott Street in Beverly, Massachusetts (also referred to as the "Site"). Actions completed in this report relate to the approved Written Proposal/Sampling and Analysis Plan Revision 2 ("SAP") for the Site dated September 29, 2017 and the Elliott Landing SAP Revision 4 dated September 29, 2017 ("Elliott Landing SAP"). Refer to the attached **Figure 1** for the site locus and **Figure 2** for the site plan.

This Site has been identified in the RCRA 2020 Corrective Action Universe list established by the United States Environmental Protection Agency (EPA). By the year 2020, EPA and the authorized states plan to have largely completed the work of implementing final remedies at all facilities requiring Corrective Action. This Site is listed under site number MAD 043415991 as USM Machinery Division. As part of the RCRA 2020 program, EPA is overseeing an audit of the historical remedial actions conducted at the property by the former property owner. EPA Region 1 has been working with the current owner's representative, Cummings Properties, LLC, on this Site since 2009, and in EPA's opinion, more sampling data are potentially needed to, among other things, understand whether vapor intrusion may be impacting indoor air quality and posing a threat to human health.

Following an EPA audit and review of existing sampling data, EPA requires further examination to determine:

- whether vapor intrusion is occurring at locations identified by EPA, including but not limited to, buildings 100, 500, and 600;
- whether contamination exists in the Shoe Ponds that presents ecological risk to aquatic life;
- whether all underground storage tanks have been removed or properly abandoned, if there are releases to the environment from the tanks, and the nature and extent of any migration of contamination from existing tanks;
- whether residual polychlorinated biphenyl (PCB) contamination exists on the fourth floor of Building 100 (formerly occupied by the North Shore Regional Vocational School) in or proximate to the former machine shop and any other area on-site where PCBs were used/managed/released and/or identified as a contaminant of concern;

- whether the PCB disposal areas (former chip grind shed and former ballfield area) meet the requirement of 40 CFR § 761.61 and the January 9, 1997 approval letter from EPA, including but not limited to the following:

  (1) required protective cover,

  (2) required cover maintenance,

  (3) required AUL documentation, and

  (4) appropriate documentation to verify that stabilized PCB contaminated soils were placed at least one foot above the high water table so that no migration of PCBs to groundwater is occurring.

These requirements were set forth in an Administrative Consent Order (ACO) between EPA and Cummings Properties, LLC with an effective date of April 13, 2017.

Specifically, this report documents actions that have taken place in January 2018 in furtherance of the work required in the ACO. Such actions have included the first round of sampling and analysis of groundwater from selected Site wells (wells related to the vapor intrusion assessment), and the first round of sampling and analysis of soil gas and indoor air from the previously designated Site interior building locations. Work was done in accordance with the SAP and the Elliott Landing SAP as updated September 29, 2017.

2.0 MARCH 2018 ACTIVITIES

No field sampling was performed in March 2018. In accordance with the Site SAP and the Elliott Landing SAP, a sampling event had been scheduled for March 20, 2018 for groundwater wells related to historical groundwater contamination and in April 2018 for vapor intrusion evaluation. Due to further well development that was required (to address one of EPA's comments in the November-December 2017 Progress Report), the March 20, 2018 sampling was postponed until March 26, 2018. At EPA's request, the sampling was further postponed until April 2018, so it would be performed at the same time as the sampling for vapor intrusion.

Based on EPA's comment in the November-December 2017 Progress Report, the groundwater wells installed in November 2017 were redeveloped starting the week of March 12, 2018 in accordance with the SAP using the bailing and purging method. Well development took place on March 12, 2018, March 16, 2018, and March 20, 2018. Individual well development forms are included as an Appendix to this progress report.

All wells were developed in accordance with the requirements in the SAP. Unfortunately, the bailing and purging method of development proved too extreme for some of these wells. Specific highlights of the development process are described below.

Wells FSL-1, FSL-4, FSL-5, FSL-6, FSL-8, FSL-9, FSL-11, FSL-12, and FSL-14 were all purged and were successfully developed. However, despite best efforts, FSL-1 (final turbidity 44.8ntu) and FSL-5 (final turbidity 46.4ntu) had higher final turbidity than optimal, although a notable improvement in turbidity levels was observed post-development.

Wells FSL-2, FSL-3, FSL-7, FSL-10, FSL-13, FSL-15, FSL-100, FSL-200, and FSL-300 ran dry during the bailing process. For these wells, the field team bailed them dry, waited a few minutes to see if there was any recovery and if not, they would move on to the next well. They rechecked the wells several hours later and noted the water levels. If there was any recovery, they would bail what was left and run the well dry again. Since the wells ran dry during the hand-bailing process, they wouldn't sustain a pumping rate of 0.5 gpm. However, based on the previous low flow sampling and development events, these wells (with the exception of FSL-2 and FSL-3) will sustain purge rates of less than 500mL/min. Recharge on wells FSL-2 and FSL-3 is so slow that future sampling efforts will likely limit sample collection to VOCs only from those wells; insufficient water volume is likely to be present for other types of samples.

In accordance with the Consent Order (Section IX.17.f.), a publicly accessible repository of significant site-related documents created after the effective date of the Consent Order, including complete copies of plans, notices, and progress reports, was created. This repository is located on Site, in the main business office of Cummings Properties at Suite 107-L and can be accessed at any time during regular business hours. Notification of the repository will be provided to all entities that received the Information Sheet in July 2017.

3.0 NEXT SCHEDULED ASSESSMENT ACTIVITIES

In accordance with the Site SAP and the Elliott Landing SAP, the sampling that had been originally scheduled for March 20, 2018 for groundwater wells related to historical groundwater contamination is to be combined with the sampling scheduled in April 2018 for vapor intrusion evaluation. The proposed schedule for sampling in April is as follows:

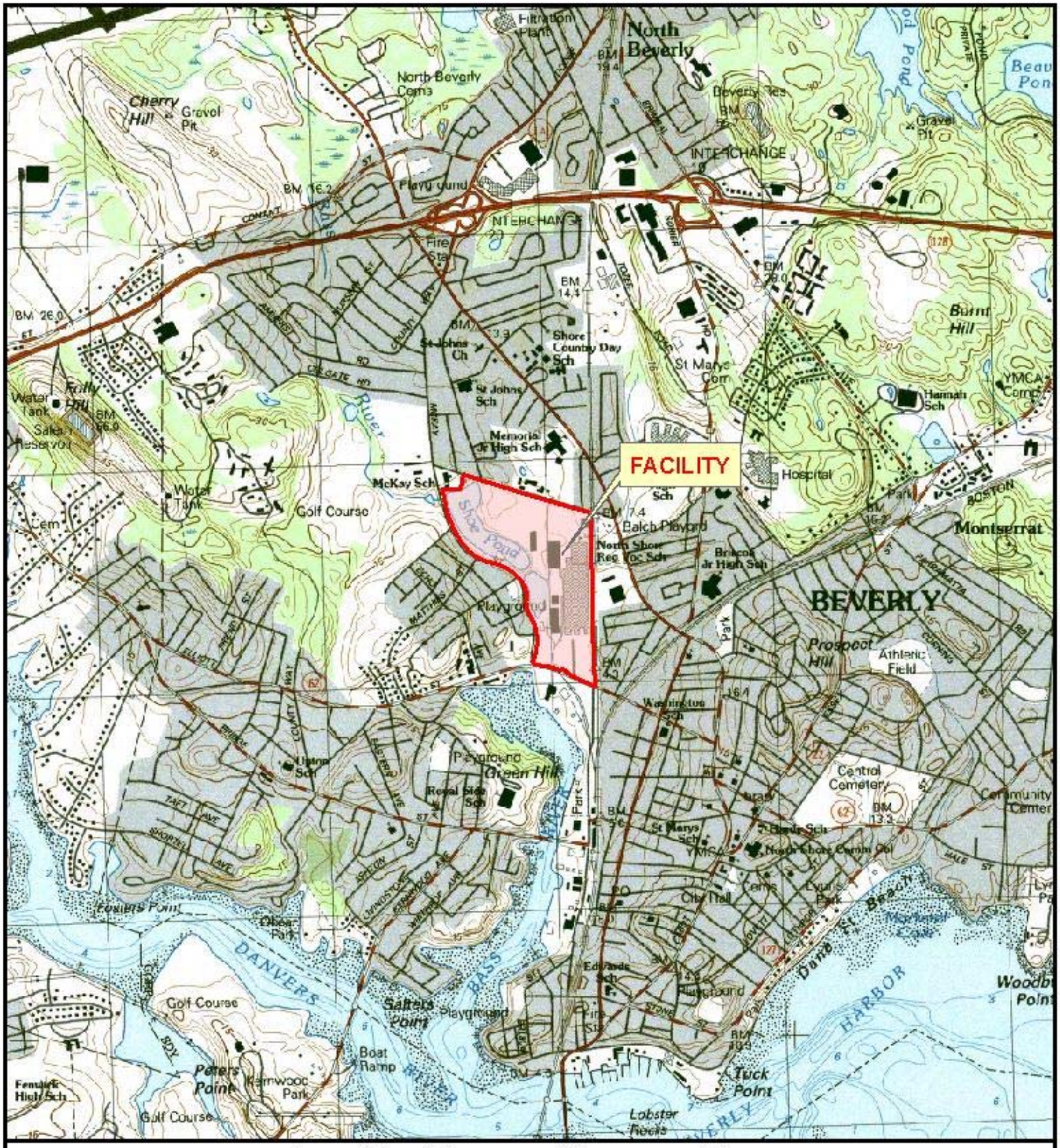
April 16-18: collect groundwater samples
April 20-21: collect soil gas samples
April 28: begin indoor air sampling
April 29: finish indoor air sampling

The results from the April 2018 sampling will be included in a Progress Report submitted in May 2018.

FIGURES

Figure 1 – Locus Plan

Figure 2 – Site Plan



SITE COORDINATES
Longitude: -70.8871 W
Lattitude: 42.5596 N
UTM 4,713,634m N
345,086m E

Approximate Scale: 1 inch = 2,000 feet (1:24,000)

Figure 1 - Locus Plan

Project Number: 12201
Client: Cummings

Created By: EAF Date: 03/15/12
Checked By: BH Date: 03/15/12

Former United Shoe Machinery North Parcel
181 Elliott Street
Beverly, MA

Reference: MassGIS USGS Quadrangle: SALEM and MARBLEHEAD NORTH
Image: M/12201_Beverly/2012/Figures

FIGURE 2

SITE PLAN

NOTE:
Locations taken from Haley & Aldrich Plan
Dated October 30, 1997.

FORMER UNITED SHOE
MACHINERY NORTH PARCEL
181 ELLIOTT STREET
BEVERLY MA

LEGEND

- STABILIZED SOIL DISPOSAL AREA
- TANKS
- FSL-X PROPOSED WELL
- HISTORIC PHASE II WELL

NORTH

FSL ASSOCIATES
Environmental Engineering & Site Remediation
358 CHESTNUT HILL AVENUE
BOSTON MASS 02135
(617) 233-0001

SCALE:	1'=125' +/-
DRAWN:	RT
CHK'D:	BAH
DATE:	3/29/17
DATE REV:	3/12/18

APPENDIX

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly — WELL #: FSL-1
LOCATION: Beverly, MA
SAMPLING CREW: KJ, MG
WEATHER CONDITIONS: Sun, 30's

PURGING DATA
REFERENCE POINT: (PVC) STEEL CASING — DATE: 3/16/18
PURGING METHOD: Bail — WELL DEPTH: 14.80 (FT)
DEDICATED EQUIPMENT: N — DEPTH TO WATER: 4.30 (FT)
WATER COLUMN HGHT: 10.50 (FT)
WELL VOLUME: 1.6 GALLONS
DIAMETER OF WELL: 2 inches — PURGE VOLUME: GALLONS

WATER PURGED ~~0.5~~ MINUTES AT 0.5 GPM — VOL PURGED 5.0 GALLONS

PURGING DATA
METHOD: Bail/Surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Black, heavy odor

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)
1450	6.65	9.42	14.887	2.78	-125.5	44.7 nts 2.5
1455	6.63	9.69	14.893	2.64	-127.3	37.8 nts 5.0
1500	6.62	9.51	14.894	2.50	-126.1	34.1 nts 7.5
1505	6.60	9.92	14.904	2.48	-124.8	40.6 10.0

FINAL FIELD DATA

pH: 6.60 (S.U.) — DISSOLVED OXYGEN: 2.48 (mg/L)
CONDUCTIVITY: 14.904 (mS/cm) — TURBIDITY: 44.8 (NTU)
TEMPERATURE: 9.92 (°C) — ORP: -124.8 (mV)

COMMENTS: well ran dry after 5.0gal. Recharged to 10.36ft after 15min. Purged w/ Sub. Pump to stability.

WELL CONDITION DATA

Protective Casing Present:	(Y)	N	Concrete/Grout Pad present:	(Y)	N
Protective Casing Locked:	Y	(N)	Standing Water:	Y	(N)
Cap on well riser:	(Y)	N	Visible Heaving:	Y	(N)
Physical Damage:	Y	(N)			

If yes, Describe:

SAMPLER'S SIGNATURE:

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly — WELL #: FSL-2
LOCATION:
SAMPLING CREW: KJ, MG
WEATHER CONDITIONS: Sun, 30's

PURGING DATA
REFERENCE POINT: (PVC) STEEL CASING — DATE: 5/16/18
PURGING METHOD: Bail — WELL DEPTH: 7.72 (FT)
DEDICATED EQUIPMENT: — DEPTH TO WATER: 4.08 (FT)
WATER COLUMN HGHT: 3.64 (FT)
WELL VOLUME: 0.14 GALLONS
DIAMETER OF WELL: 1 inches — PURGE VOLUME: GALLONS

WATER PURGED: — MINUTES AT: N/A GPM — VOL PURGED: 0.10 GALLONS

PURGING DATA
METHOD: Bail/Surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: ~~Clear, no odor~~ Brown, very turbid.

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER ~~REMOVED~~ FROM WELL (GALLONS)

FINAL FIELD DATA

pH: (S.U.) — DISSOLVED OXYGEN: (mg/L)
CONDUCTIVITY: (mS/cm) — TURBIDITY: (NTU)
TEMPERATURE: (°C) — ORP: (mV)

COMMENTS: well purged dry immediately after one volume @ 1330. Returned @ end of day, well had recharged to 6.12ft. ~~Not enough volume~~

WELL CONDITION DATA

Protective Casing Present:	(Y)	N	Concrete/Grout Pad present:	(Y)	N
Protective Casing Locked:	Y	(N)	Standing Water:	Y	(N)
Cap on well riser:	(Y)	N	Visible Heaving:	Y	(N)
Physical Damage:	Y	(N)			

If yes, Describe:

SAMPLER'S SIGNATURE:

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly — WELL #: FSL-3
LOCATION:
SAMPLING CREW: KJ, MG
WEATHER CONDITIONS: Sun, 30's

PURGING DATA
REFERENCE POINT: (PVC) STEEL CASING
PURGING METHOD: Bail
DEDICATED EQUIPMENT:
DIAMETER OF WELL: 1 inches

DATE: 3/16/18
WELL DEPTH: 7.69 (FT)
DEPTH TO WATER: 3.21 (FT)
WATER COLUMN HGHT: 4.48 (FT)
WELL VOLUME: 0.35 GALLONS
PURGE VOLUME: GALLONS

WATER PURGED: — MINUTES AT: — GPM
VOL PURGED: 0.35 GALLONS

PURGING DATA
METHOD: Bail / surge / geo pump.

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Grey, no odor

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)

FINAL FIELD DATA

pH: (S.U.)
CONDUCTIVITY: (mS/cm)
TEMPERATURE: (°C)
DISSOLVED OXYGEN: (mg/L)
TURBIDITY: (NTU)
ORP: (mV)

COMMENTS: well ran dry immediately @ 1355. Recharged to 4.65 @ 1410. Purged and ran dry again.

WELL CONDITION DATA

Protective Casing Present:	(Y)	N	Concrete/Grout Pad present:	(Y)	N
Protective Casing Locked:	Y	(N)	Standing Water:	Y	(N)
Cap on well riser:	(Y)	N	Visible Heaving:	Y	(N)
Physical Damage:	Y	(N)			

If yes, Describe:

SAMPLER'S SIGNATURE:

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly — WELL #: FSL-4
LOCATION:
SAMPLING CREW: KJ, MG
WEATHER CONDITIONS: Sun, 30's

PURGING DATA
REFERENCE POINT: (PVC) STEEL CASING
PURGING METHOD: Bailer
DEDICATED EQUIPMENT: None
DIAMETER OF WELL: 2 inches

DATE: 3/16/18
WELL DEPTH: 11.77 (FT)
DEPTH TO WATER: 2.72 (FT)
WATER COLUMN HGHT: 9.05 (FT)
WELL VOLUME: 2.0 GALLONS
PURGE VOLUME: 6.0 GALLONS

WATER PURGED: 20 MINUTES AT: 0.5 GPM — VOL PURGED: 28 GALLONS

PURGING DATA
METHOD: Bail/surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Brown, no odor

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)	
1130	6.18	12.14	4.722	2.18	-39.8	2.5	34.6 NTU
1135	6.10	12.67	4.710	2.10	-34.2	5.0	13.8 NTU
1140	6.06	12.74	4.715	2.00	-28.1	7.5	10.1 NTU
1145	6.07	12.81	4.717		-26.6	10.0	9.6 NTU

FINAL FIELD DATA

pH: 6.06 (S.U.)
CONDUCTIVITY: 4.717 (mS/cm)
TEMPERATURE: 12.81 (°C)
DISSOLVED OXYGEN: 1.96 (mg/L)
TURBIDITY: 9.0 (NTU)
ORP: -24.8 (mV)

COMMENTS:

WELL CONDITION DATA

Protective Casing Present:	(Y)	N	Concrete/Grout Pad present:	(Y)	N
Protective Casing Locked:	Y	(N)	Standing Water:	Y	(N)
Cap on well riser:	(Y)	N	Visible Heaving:	Y	(N)
Physical Damage:	Y	(N)			

If yes, Describe:

SAMPLER'S SIGNATURE:

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly — WELL #: FSL-5
LOCATION: Beverly, MA
SAMPLING CREW: KJ, MG
WEATHER CONDITIONS: Sun, 30's

PURGING DATA
REFERENCE POINT: (PVC) STEEL CASING
PURGING METHOD: Bail
DEDICATED EQUIPMENT: N
DIAMETER OF WELL: 2 inches

DATE: 3/16/18
WELL DEPTH: 14.85 (FT)
DEPTH TO WATER: 4.32 (FT)
WATER COLUMN HGHT: 10.53 (FT)
WELL VOLUME: 2.0 GALLONS
PURGE VOLUME: 6.0 GALLONS

WATER PURGED 20 MINUTES AT 0.5 GPM — VOL PURGED 10 GALLONS

PURGING DATA
METHOD: Bail/Surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Brown, no odor, ~~little~~ sediment present at bottom of well.

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)
1530	6.95	5.85	23.654	2.12	-52.4	45.1 2.5
1535	6.80	6.29	23.654	2.14	-40.0	50.6 5.0
1540	6.74	6.37	23.650	2.28	-37.8	46.7 7.5
1545	6.72	6.40	23.641	2.34	-39.4	47.2 10.0

FINAL FIELD DATA

pH: 6.71 (S.U.) — DISSOLVED OXYGEN: 2.39 (mg/L)
CONDUCTIVITY: 23.640 (mS/cm) — TURBIDITY: 46.4 (NTU)
TEMPERATURE: 6.47 (°C) — ORP: -39.4 (mV)

COMMENTS:

WELL CONDITION DATA

Protective Casing Present: (Y) N
Protective Casing Locked: Y (N)
Cap on well riser: (Y) N
Physical Damage: Y (N)
If yes, Describe:

Concrete/Grout Pad present: (Y) N
Standing Water: Y (N)
Visible Heaving: Y (N)

SAMPLER'S SIGNATURE:

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly — WELL #: FSL-6
LOCATION: Beverly, MA
SAMPLING CREW: KJ, CR
WEATHER CONDITIONS: Sun, 30's

PURGING DATA
REFERENCE POINT: (PVC) STEEL CASING — DATE: 5/12/18
PURGING METHOD: Bail — WELL DEPTH: 10.49 (FT)
DEDICATED EQUIPMENT: N — DEPTH TO WATER: 2.14 (FT)
WATER COLUMN HGHT: 8.35 (FT)
WELL VOLUME: 1.33 GALLONS
DIAMETER OF WELL: 2 inches — PURGE VOLUME: 1.5 GALLONS
WATER PURGED: 15 MINUTES AT: 1 GPM — VOL PURGED: ~~20~~ 6.20 (KJ) GALLONS

PURGING DATA
METHOD: Bail / surge
ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Brown, no odor

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)
0900	6.37	6.40	4.214	3.43	73.2	21.8 ntg 5
0905	6.34	6.31	4.212	3.26	70.1	15.6 10
0920	6.50	6.57	4.210	3.10	72.4	9.4 15
0925	6.44	6.61	4.208	3.04	72.8	7.8 20

FINAL FIELD DATA

pH: 6.40 (S.U.) — DISSOLVED OXYGEN: 3.00 (mg/L)
CONDUCTIVITY: 4.207 (mS/cm) — TURBIDITY: 8.1 (NTU)
TEMPERATURE: 6.60 (°C) — ORP: 72.8 (mV)

COMMENTS: well extremely turbid at first. Needed much more volume purged than usual.

WELL CONDITION DATA

Protective Casing Present:	(Y)	N	Concrete/Grout Pad present:	(Y)	N
Protective Casing Locked:	Y	(N)	Standing Water:	Y	(N)
Cap on well riser:	(Y)	N	Visible Heaving:	Y	(N)
Physical Damage:	Y	(N)			

If yes, Describe:

SAMPLER'S SIGNATURE: K. J. Jon

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: ~~ES~~ Cummings Beverly — WELL #: FSL-7
LOCATION: Beverly, MA
SAMPLING CREW: KJ, CR
WEATHER CONDITIONS:

PURGING DATA
REFERENCE POINT: (PVC) STEEL CASING — DATE: 3/12/18
PURGING METHOD: Bail — WELL DEPTH: 12.45 (FT)
DEDICATED EQUIPMENT: — DEPTH TO WATER: 3.40 (FT)
WATER COLUMN HGHT: 9.05 (FT)
WELL VOLUME: 1.5 GALLONS
DIAMETER OF WELL: 2 inches — PURGE VOLUME: 1.5 GALLONS

WATER PURGED: 5 MINUTES AT: 0.5 GPM — VOL PURGED: 5.0 GALLONS

PURGING DATA
METHOD: Bail/surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Brown, no odor

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)
1000	6.54	7.29	4.718	2.76	106.4	2.5 78.5 mtg

FINAL FIELD DATA

pH: ____ (S.U.) — DISSOLVED OXYGEN: ____ (mg/L)
CONDUCTIVITY: ____ (mS/cm) — TURBIDITY: ____ (NTU)
TEMPERATURE: ____ (°C) — ORP: ____ (mV)

COMMENTS: well purged to dryness after ~~level~~ Bailing and one set of readings. Returned at 15:15, water level was at 7.49 Ft. Bailed dry again

WELL CONDITION DATA

Protective Casing Present: (Y) N
Protective Casing Locked: (Y) N
Cap on well riser: (Y) N
Physical Damage: Y (N)
If yes, Describe:

Concrete/Grout Pad present: (Y) N
Standing Water: Y (N)
Visible Heaving: Y (N)

SAMPLER'S SIGNATURE: [signature]

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly — WELL #: FSh-8
LOCATION: Beverly, MA
SAMPLING CREW: KJ
WEATHER CONDITIONS: Sun. 40's

PURGING DATA — DATE: 3/20/18
REFERENCE POINT: (PVC) STEEL CASING — WELL DEPTH: 12.64 (FT)
PURGING METHOD: Bail — DEPTH TO WATER: 3.44 (FT)
DEDICATED EQUIPMENT: — WATER COLUMN HGHT: 8.60 (FT)
WELL VOLUME: 1.37 GALLONS
DIAMETER OF WELL: 2 inches — PURGE VOLUME: 4.0 GALLONS

WATER PURGED 20 MINUTES AT 0.5 GPM — VOL PURGED 8.0 GALLONS

PURGING DATA
METHOD: Bail/Surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Brown, no odor

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)	
			3.330				
0920	6.54	9.64	~~3.~~	2.74	-49.8	2.5	26.1 ntu
0925	6.32	9.50	3.320	2.68	-44.6	5.0	20.8 ntu
0930	6.30	9.69	3.318	2.68	-42.1	7.5	13.7
0935	6.31	9.71	3.310	2.57	-41.1	10.0	12.1 ntu

FINAL FIELD DATA

pH: 6.31 (S.U.) — DISSOLVED OXYGEN: 2.50 (mg/L)
CONDUCTIVITY: 3.310 (mS/cm) — TURBIDITY: 12.0 (NTU)
TEMPERATURE: 9.71 (°C) — ORP: -40.6 (mV)

COMMENTS:

WELL CONDITION DATA

Protective Casing Present:	(Y)	N	Concrete/Grout Pad present:	(Y)	N
Protective Casing Locked:	Y	(N)	Standing Water:	Y	(N)
Cap on well riser:	(Y)	N	Visible Heaving:	Y	(N)
Physical Damage:	Y	(N)			

If yes, Describe:

SAMPLER'S SIGNATURE:

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly — WELL #: FSL-9
LOCATION: Beverly, MA
SAMPLING CREW: KJ
WEATHER CONDITIONS: Sun, 40's

PURGING DATA
REFERENCE POINT: PVC — STEEL CASING
PURGING METHOD: Bail/Surge
DEDICATED EQUIPMENT: N
DIAMETER OF WELL: 2 inches

DATE: 3/20
WELL DEPTH: 12.02 (FT)
DEPTH TO WATER: 6.38 (FT)
WATER COLUMN HGHT: 5.64 (FT)
WELL VOLUME: 1 GALLONS
PURGE VOLUME: 3.0 GALLONS

WATER PURGED: ~~0.5~~ 20 MINUTES AT 0.5 GPM
VOL PURGED: 7.0 GALLONS

PURGING DATA
METHOD: Bail/Surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Brown, no odor.

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)	
0800	6.37	8.69	1.179	1.86	92.1	2.5gal	20.5 ntu
0805	6.30	8.94	1.120	1.82	90.8	5.0gal	16.7 ntu
0810	6.29	9.07	1.118	1.64	86.4	7.5gal	8.6 ntu
0815	6.28	9.14	1.116	1.60	82.2	10.0gal	7.4 ntu

FINAL FIELD DATA

pH: 6.27 (S.U.)
CONDUCTIVITY: 1.116 (mS/cm)
TEMPERATURE: 9.22 (°C)
DISSOLVED OXYGEN: 1.60 (mg/L)
TURBIDITY: 7.0 (NTU)
ORP: 82.2 (mV)

COMMENTS:

WELL CONDITION DATA

Protective Casing Present: (Y) N
Protective Casing Locked: Y (N)
Cap on well riser: (Y) N
Physical Damage: Y (N)
If yes, Describe:

Concrete/Grout Pad present: (Y) N
Standing Water: Y (N)
Visible Heaving: Y (N)

SAMPLER'S SIGNATURE:

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly
WELL #: FSL-10
LOCATION: Beverly, MA
SAMPLING CREW: KJ
WEATHER CONDITIONS: Sun, 40's

PURGING DATA
DATE: 3/20/18
REFERENCE POINT: PVC STEEL CASING
PURGING METHOD: Bail
DEDICATED EQUIPMENT: N
DIAMETER OF WELL: 2 inches
WELL DEPTH: 14.70 (FT)
DEPTH TO WATER: 2.24 (FT)
WATER COLUMN HGHT: 12.46 (FT)
WELL VOLUME: 2.0 GALLONS
PURGE VOLUME: 6.0 GALLONS

WATER PURGED — MINUTES AT — GPM
VOL PURGED: 10 GALLONS

PURGING DATA
METHOD: Bail/Surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Brown, no odor

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED ~~FROM WELL~~ (GALLONS)

FINAL FIELD DATA

pH: / (S.U.)
CONDUCTIVITY: / (mS/cm)
TEMPERATURE: / (°C)
DISSOLVED OXYGEN: / (mg/L)
TURBIDITY: / (NTU)
ORP: / (mV)

COMMENTS: well purged dry to 13.20ft @ 1045. Returned at end of day, well recovered to 9.57ft, purged dry again.

WELL CONDITION DATA

Protective Casing Present:	Y	N	Concrete/Grout Pad present:	Y	N
Protective Casing Locked:	Y	N	Standing Water:	Y	N
Cap on well riser:	Y	N	Visible Heaving:	Y	N
Physical Damage:	Y	N			

If yes, Describe:

SAMPLER'S SIGNATURE:

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly — WELL #: FSL-11
LOCATION: Beverly MA
SAMPLING CREW: KJ, CK
WEATHER CONDITIONS:

PURGING DATA
REFERENCE POINT: (PVC) STEEL CASING — DATE: 3/12/18
PURGING METHOD: Bail — WELL DEPTH: 16.71 (FT)
DEDICATED EQUIPMENT: N — DEPTH TO WATER: 4.61 (FT)
WATER COLUMN HGHT: 12.1 (FT)
WELL VOLUME: 2.0 GALLONS
DIAMETER OF WELL: 2 inches — PURGE VOLUME: ~~2.0~~ GALLONS

WATER PURGED: 15 MINUTES AT: 0.5 GPM — VOL PURGED: 4.0 GALLONS

PURGING DATA
METHOD: Bail / Surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Clear, no odor

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)
1120	6.44	9.08	31.0984	2.68	73.6	2.5gal 27.5ntu
1125	6.44	9.23	31.019	2.51	74.2	5.0gal 13.6ntu
1130	6.42	9.36	31.010	2.47	76.2	7.5gal 14.7ntu

FINAL FIELD DATA

pH: 6.42 (S.U.) — DISSOLVED OXYGEN: 2.47 (mg/L)
CONDUCTIVITY: 31.010 (mS/cm) — TURBIDITY: 12.8 ntu (NTU)
TEMPERATURE: 9.39 (°C) — ORP: 77.1 (mV)

COMMENTS: purge water very clear. Very little sediment present at bottom of well

WELL CONDITION DATA

Protective Casing Present: (Y) N — Concrete/Grout Pad present: (Y) N
Protective Casing Locked: Y (N) — Standing Water: Y (N)
Cap on well riser: (Y) N — Visible Heaving: Y (N)
Physical Damage: Y (N)
If yes, Describe:

SAMPLER'S SIGNATURE:

EST - WELL DEVELOPMENT RECORD

PROJECT NAME ~~FSL~~ ~~Bel~~ Cummings Beverly WELL # FSL-12
LOCATION Beverly, MA
SAMPLING CREW KJ, CR
WEATHER CONDITIONS: Sun, 30's

PURGING DATA
REFERENCE POINT: (PVC) STEEL CASING
PURGING METHOD
DEDICATED EQUIPMENT
DIAMETER OF WELL: 2 inches
WATER PURGED ~~0.5~~ 1.5 (KJ) MINUTES AT 0.5 GPM

DATE 3/12/18
WELL DEPTH 15.15 (FT)
DEPTH TO WATER 7.53 (FT)
WATER COLUMN HGHT 7.62 (FT)
WELL VOLUME 1.5 GALLONS
PURGE VOLUME 1.5 GALLONS
VOL PURGED 5 GALLONS

PURGING DATA
METHOD: Bail/Surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Brown, no odor

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)
1035	6.67	9.81	8.350	3.91	-20.9	30.6/2.5
1040	6.60	9.94	8.289	3.84	-24.6	10.8 NH4 5.0
1045	6.54	10.18	8.280	3.76	-23.1	12.7 NH4 7.5

FINAL FIELD DATA

pH: 6.52 (S.U.)
CONDUCTIVITY: 8.279 (mS/cm)
TEMPERATURE: 10.27 (°C)
DISSOLVED OXYGEN: 3.76 (mg/L)
TURBIDITY: 11.7 (NTU)
ORP: -23.0 (mV)

COMMENTS:

WELL CONDITION DATA

Protective Casing Present: (Y) N
Protective Casing Locked: Y (N)
Cap on well riser: (Y) N
Physical Damage: Y (N)
If yes, Describe:

Concrete/Grout Pad present: (Y) N
Standing Water: Y (N)
Visible Heaving: Y (N)

SAMPLER'S SIGNATURE:

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly — WELL #: FSL-13
LOCATION: Beverly, MA
SAMPLING CREW: KJ, MG
WEATHER CONDITIONS:

PURGING DATA
REFERENCE POINT: PVC / STEEL CASING
PURGING METHOD: Bail
DEDICATED EQUIPMENT: N/A
DIAMETER OF WELL: 2 inches

DATE: 3/16/18
WELL DEPTH: 16.74 (FT)
DEPTH TO WATER: 5.08 (FT)
WATER COLUMN HGHT: 11.66 (FT)
WELL VOLUME: 2.8 GALLONS
PURGE VOLUME: 6.8 GALLONS

WATER PURGED: — MINUTES AT: — GPM
VOL PURGED: 11 GALLONS

PURGING DATA
METHOD: Bail / Surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Brown, no odor

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)

FINAL FIELD DATA

pH: (S.U.)
CONDUCTIVITY: (mS/cm)
TEMPERATURE: (°C)
DISSOLVED OXYGEN: (mg/L)
TURBIDITY: (NTU)
ORP: (mV)

COMMENTS: Well purged dry during bailing WL: 15.82 @ 0830. Returned @ end of day, WL was 10.38. Bailed dry again. (1gal)

WELL CONDITION DATA

Protective Casing Present:	(Y)	N	Concrete/Grout Pad present:	(Y)	N
Protective Casing Locked:	(Y)	N	Standing Water:	(Y)	N
Cap on well riser:	(Y)	N	Visible Heaving:	Y	(N)
Physical Damage:	Y	(N)			

If yes, Describe:

SAMPLER'S SIGNATURE: Jan J Jr

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly WELL #: FSL-14
LOCATION: Beverly
SAMPLING CREW: KS, CR
WEATHER CONDITIONS:

PURGING DATA
REFERENCE POINT: (PVC) STEEL CASING DATE: 8/12/18
PURGING METHOD: Bail WELL DEPTH: 12.05 (FT)
DEDICATED EQUIPMENT: N DEPTH TO WATER: 2.32 (FT)
WATER COLUMN HGHT: 9.73 (FT)
WELL VOLUME: 4.7 1.50 GALLONS
DIAMETER OF WELL: 2 inches PURGE VOLUME: 30.0 GALLONS
WATER PURGED 20 MINUTES AT 0.5 GPM VOL PURGED 40.0 GALLONS

PURGING DATA
METHOD: Bail/Surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Black no odor. Well extremely turbid. will require large purge volume

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)
0940	7.96	5.76	13.664	3.50	-11.4	2.5
0945	7.89	5.85	13.355	2.04	-14.0	5.0
0950	7.86	5.94	13.340	1.91	-42.2	7.5
0955	7.82	6.10	13.337	1.86	-43.9	10.0

NTU: 7.9, 7.8, 8.6, 10.1

FINAL FIELD DATA

pH: 7.81 (S.U.) DISSOLVED OXYGEN: 1.82 (mg/L)
CONDUCTIVITY: 13.331 (mS/cm) TURBIDITY: 10.1 (NTU)
TEMPERATURE: 6.02 (°C) ORP: -44.8 (mV)

COMMENTS:

WELL CONDITION DATA

Protective Casing Present: (Y) N Concrete/Grout Pad present: (Y) N
Protective Casing Locked: Y (N) Standing Water: Y (N)
Cap on well riser: (Y) N Visible Heaving: Y (N)
Physical Damage: Y (N)
If yes, Describe:

SAMPLER'S SIGNATURE:

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly — WELL #: FSL - 15
LOCATION: Beverly, MA
SAMPLING CREW: KJ, CR
WEATHER CONDITIONS: Sun,

PURGING DATA
REFERENCE POINT: (PVC) STEEL CASING
PURGING METHOD: Bail
DEDICATED EQUIPMENT: —
DIAMETER OF WELL: 2 inches

DATE: 3/12/18
WELL DEPTH: 12.84 (FT)
DEPTH TO WATER: 2.21 (FT)
WATER COLUMN HGHT: 10.63 (FT)
WELL VOLUME: 2.0 GALLONS
PURGE VOLUME: ____ GALLONS

WATER PURGED: — MINUTES AT: — GPM
VOL PURGED: 2.0 GALLONS

PURGING DATA
METHOD: Bail / Surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: ____

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)

FINAL FIELD DATA

pH: ____ (S.U.)
CONDUCTIVITY: ____ (mS/cm)
TEMPERATURE: ____ (°C)
DISSOLVED OXYGEN: ____ (mg/L)
TURBIDITY: ____ (NTU)
ORP: ____ (mV)

COMMENTS: well purged to dryness during bailing process. Did not recharge after 30 min. Returned @ 1530 water level was 9.94. Bailed dry again.

WELL CONDITION DATA

Protective Casing Present:	(Y)	N	Concrete/Grout Pad present:	(Y)	N
Protective Casing Locked:	Y	(N)	Standing Water:	Y	(N)
Cap on well riser:	(Y)	N	Visible Heaving:	Y	(N)
Physical Damage:	Y	(N)			

If yes, Describe: ____

SAMPLER'S SIGNATURE: [signature]

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly
WELL #: FSL-100
LOCATION: Beverly MA
SAMPLING CREW: KJ
WEATHER CONDITIONS: Sun, 40°

PURGING DATA

DATE: 3/20/18
REFERENCE POINT: (PVC) STEEL CASING
WELL DEPTH: 7.00 (FT)
PURGING METHOD: Bail
DEPTH TO WATER: 3.67 (FT)
DEDICATED EQUIPMENT: N
WATER COLUMN HGHT: 3.33 (FT)
WELL VOLUME: 0.53 GALLONS
DIAMETER OF WELL: 2 inches
PURGE VOLUME: 1.50 GALLONS
WATER PURGED: — MINUTES AT — GPM
VOL PURGED: 1.0 GALLONS

PURGING DATA

METHOD: Bail/Surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Brown, no odor

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)

FINAL FIELD DATA

pH: (S.U.)
CONDUCTIVITY: (mS/cm)
TEMPERATURE: (°C)
DISSOLVED OXYGEN: (mg/L)
TURBIDITY: (NTU)
ORP: (mV)

COMMENTS: well purged to dryness @ 6.42 ft @ ~~1135am~~ 1235pm (KJ) Returned at 1450, WL = 5.91 ft. Purged dry again.

WELL CONDITION DATA

Protective Casing Present: (Y) N
Protective Casing Locked: Y (N)
Cap on well riser: (Y) N
Physical Damage: Y (N)
If yes, Describe:

Concrete/Grout Pad present: (Y) N
Standing Water: Y (N)
Visible Heaving: Y (N)

SAMPLER'S SIGNATURE: [signature]

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly — WELL #: FSL-200
LOCATION: Beverly, MA
SAMPLING CREW: KS
WEATHER CONDITIONS: Sun, 40's

PURGING DATA — DATE: 3/20/18

REFERENCE POINT: (PVC) STEEL CASING
PURGING METHOD: Bail
DEDICATED EQUIPMENT: N
DIAMETER OF WELL: 2 inches

WELL DEPTH: 11.84 (FT)
DEPTH TO WATER: 2.07 (FT)
WATER COLUMN HGHT: 9.77 (FT)
WELL VOLUME: 1.56 GALLONS
PURGE VOLUME: 5.0 GALLONS

WATER PURGED: ✓ MINUTES AT: / GPM
VOL PURGED: 3.0 GALLONS

PURGING DATA
METHOD: Bail / surge.

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Brown, no odor

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)

FINAL FIELD DATA

pH: (S.U.)
CONDUCTIVITY: (mS/cm)
TEMPERATURE: (°C)
DISSOLVED OXYGEN: (mg/L)
TURBIDITY: (NTU)
ORP: (mV)

COMMENTS: well purged immediately to dryness @ 10.41 ft @ 1150 Am. Returned at 1430, wl was at 8.71 ft, purged dry again.

WELL CONDITION DATA

Protective Casing Present:	(Y)	N	Concrete/Grout Pad present:	(Y)	N
Protective Casing Locked:	Y	(N)	Standing Water:	Y	(N)
Cap on well riser:	(Y)	N	Visible Heaving:	Y	(N)
Physical Damage:	Y	(N)			

If yes, Describe:

SAMPLER'S SIGNATURE:

EST - WELL DEVELOPMENT RECORD

PROJECT NAME: Cummings Beverly
WELL #: FSL-300
LOCATION: Beverly, MA
SAMPLING CREW: KJ
WEATHER CONDITIONS: Sun, 40's

PURGING DATA
REFERENCE POINT: (PVC) STEEL CASING
PURGING METHOD: Bail
DEDICATED EQUIPMENT:
DIAMETER OF WELL: 2 inches

DATE: 3/20/18
WELL DEPTH: 13.74 (FT)
DEPTH TO WATER: 8.26 (FT)
WATER COLUMN HGHT: 5.48 (FT)
WELL VOLUME: 0.87 GALLONS
PURGE VOLUME: 2.63 GALLONS

WATER PURGED: — MINUTES AT: — GPM
VOL PURGED: 2.0 GALLONS

PURGING DATA
METHOD: Bail/Surge

ODOR AND PHYSICAL APPEARANCE OF SAMPLE: Brown, no odor

EVACUATION/STABILIZATION TEST DATA

TIME	pH UNITS	TEMP (°C)	CONDUCTANCE (mS/cm)	Dissolved Oxygen (mg/L)	ORP (mV)	CUMULATIVE VOL OF WATER REMOVED FROM WELL (GALLONS)

FINAL FIELD DATA

pH: (S.U.)
CONDUCTIVITY: (mS/cm)
TEMPERATURE: (°C)
DISSOLVED OXYGEN: (mg/L)
TURBIDITY: (NTU)
ORP: (mV)

COMMENTS: well purged to dryness @ 12.07ft @ 1315
Returned at 1520, WL = 10.17. Purged dry again.

WELL CONDITION DATA

Protective Casing Present:	(Y)	N	Concrete/Grout Pad present:	(Y)	N
Protective Casing Locked:	Y	(N)	Standing Water:	Y	(N)
Cap on well riser:	(Y)	N	Visible Heaving:	Y	(N)
Physical Damage:	Y	(N)			

If yes, Describe:

SAMPLER'S SIGNATURE: John J Jr